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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MENEFEE, JAMES A

ART UNIT PAPER NUMBER

2828

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/874,501

Applicant(s)

GAO, WEI

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.


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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

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DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 10 September 2001 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. While the copies of the references have been received, there is no form PTO-1449 or the like in the file. The IDS has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "not necessarily" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. It is unclear, since the term "not necessarily" does not preclude the member from carrying an electrical signal. See MPEP § 2173.05(d). The claim has been examined as if the wire must not carry an electrical signal.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1-2, 4-5, 11-12, 14-16, 21, 27-28, and 30-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuribayashi et al. (US 6,023,481). Kuribayashi discloses the claimed invention as follows:

Regarding claims 1, 32-33 and 35, Kuribayashi discloses in Fig. 5 a laser diode assembly comprising a carrier 32 having a top and bottom, the top having a conductive layer 20,22 sized for attaching at least two bonding members thereto, a laser diode 18 coupled to the carrier 32 and having first and second conductive pads formed thereon and sized for attaching at least one bonding member thereto, and first and second bonding members 24,28 coupling the conductive pads to the conductive layer 20,22. While there is not an explicit disclosure of conductive pads on the laser, it is inherent that they are there because such pads are necessary for attaching bonding wires 24,28.

Regarding claim 2, the carrier 32 is insulating.

Regarding claims 4-5 and 31, the conductive pads are formed on opposing sides of a top side of the laser diode 18.

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Regarding claim 11, it is not explicitly disclosed that heat will be dissipated from the laser through the conductive pads. Since the bonding wires are made of conductive material, then heat will necessarily dissipate out from the laser through the wires.

Regarding claim 12, the bonding members 24, 28 are wires.

Regarding claims 14-15, the conductive layer comprises first and second portions 20,22, where one bonding member is coupled to each of the portions. The portions 20,22 are electrically isolated, as they are only connected by way of the insulating carrier 32.

Regarding claims 16 and 34, the carrier transfers heat from the conductive layer down through to the bottom of the carrier.

Regarding claim 21, at least one of the bonding members carries an electrical signal.

Regarding claims 27-28, these claims merely detail the intended use of the device. The intended use of a device is not germane to the patentability of the device itself, and therefore these claims have not been given patentable weight.

Regarding claim 30, as the laser diode is mounted on the carrier, it is inherent that the carrier is structured and arranged for mounting a laser diode thereto.

Claims 1-5, 11-13, 16-18, 21, 23, 27-28, 30-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Peterson (US 6,072,815). Peterson discloses the claimed invention as follows:

Regarding claim 1, 32-33, and 35, Peterson discloses in Fig. 1 a laser diode assembly comprising a carrier 18 having a top and bottom, the top having a conductive layer 32 sized for attaching at least two bonding members thereto, a laser diode 12 coupled to the carrier 18 and

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having first and second conductive pads formed thereon and sized for attaching at least one bonding member thereto, and first and second bonding members (wires not numbered) coupling the conductive pads to the conductive layer 32. While there is not an explicit disclosure of conductive pads on the laser, it is inherent that they are there because such pads are necessary for attaching bonding wires.

Regarding claims 2-3, the carrier 18 is insulating and may be made of BeO or AlN.

Regarding claims 4-5 and 31, the conductive pads are formed on opposing sides of a top side of the laser diode 12.

Regarding claim 11, it is not explicitly disclosed that heat will be dissipated from the laser through the conductive pads. Since the bonding wires are made of conductive material, then heat will necessarily dissipate out from the laser through the wires.

Regarding claim 12, the bonding members are wires.

Regarding claim 13, there are numerous bonding members, therefore a third bonding member is included.

Regarding claims 16 and 34, the carrier transfers heat from the conductive layer down through to the bottom of the carrier.

Regarding claims 17-18, there is further a Pelter element 16 that acts as a TEC and a heat sink.

Regarding claim 21, at least one of the bonding members carries an electrical signal.

Regarding claim 23, there are numerous bonding members, therefore it can be interpreted that more than one bonding member is included as the first bonding member.

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Regarding claims 27-28, these claims merely detail the intended use of the device. The intended use of a device is not germane to the patentability of the device itself, and therefore these claims have not been given patentable weight.

Regarding claim 30, as the laser diode is mounted on the carrier, it is inherent that the carrier is structured and arranged for mounting a laser diode thereto.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 10, 17-20, 22, 26, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuribayashi. Kuribayashi discloses the limitations of the claims as shown above, but does not disclose the following.

Regarding claim 3, the specific materials of the carrier are not disclosed. However, it is disclosed that the carrier is insulating, and among these materials are known insulators. It would have been obvious to one skilled in the art to make the carrier of these materials, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 10, a laser diode will typically have top and bottom electrodes. It would have been obvious to make the laser diode in this manner so that it may be electrically pumped.

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As one of the electrodes will be on top, at least one of the conductive pads will be coupled to the top electrode.

Regarding claim 17, there is not disclosed a heat sink at the bottom of the carrier. However, heat sinks are well known in the art and are often used in laser systems containing a Peltier element such as in Kuribayashi. It would have been obvious to one skilled in the art to include such a heat sink in order to further dissipate heat from the laser, as is well known.

Regarding claim 18, Peltier element 14, which is a TEC device, is included.

Regarding claims 19-20, it is well known that a laser diode may comprise n and p sides. It would have been obvious to make the laser diode in this manner so that the laser diode can be efficiently and electrically pumped, as is well known. In such a laser, the top is typically one conductivity, while the bottom is the other. These can be switched depending on the manner in which current will be conducted through the laser, and such a switching will not significantly change the operation of the device and is deemed an obvious design choice. Depending on which of the p-type or n-type side is chosen for the top, claim 19 or 20 will be met.

Regarding claim 22, it is not disclosed that one of the wires may not carry an electrical signal. However, wires that are used purely for heat transfer are known in the art. It would have been obvious to include on such wire with the other wires in order to dissipate heat from the laser diode and send it to the cooling system, as is well known.

Regarding claims 26 and 29, the wavelength of emission of the laser diode is not disclosed. However, 980 nm lasers are well known in the art, and it would have been obvious to one skilled in the art to use this specific type of laser diode as a matter of obvious engineering design choice depending on the intended application for the use of the laser.

Claims 10, 19-20, 22, and 24-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peterson. Peterson discloses the limitations of the claims as shown above, but does not disclose the following.

Regarding claim 10, it is not disclosed that the laser diode has top and bottom electrodes. A laser diode will typically have top and bottom electrodes. It would have been obvious to make the laser diode in this manner so that it may be electrically pumped. As one of the electrodes will be on top, at least one of the conductive pads will be coupled to the top electrode.

Regarding claims 19-20, it is not disclosed that the diode has n-type and p-type sides as claimed. It is well known that a laser diode may comprise n and p sides. It would have been obvious to make the laser diode in this manner so that the laser diode can be efficiently and electrically pumped, as is well known. In such a laser, the top is typically one conductivity, while the bottom is the other. These can be switched depending on the manner in which current will be conducted through the laser, and such a switching will not significantly change the operation of the device and is deemed an obvious design choice. Depending on which of the p-type or n-type side is chosen for the top, claim 19 or 20 will be met.

Regarding claim 22, it is not disclosed that one of the wires may not carry an electrical signal. However, wires that are used purely for heat transfer are known in the art. It would have been obvious to include on such wire with the other wires in order to dissipate heat from the laser diode and send it to the cooling system, as is well known.

Regarding claims 24-25, it is not disclosed that the number of first bonding members is either equivalent or not equivalent to the number of second bonding members. Peterson does not

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list the numbers of first and second bonding members, so there is no way of knowing if the numbers are equivalent or not. However, the number of bonding members being equivalent or non-equivalent does not appear to be significant to the operation of the device. Thus, it would have been an obvious design choice to use either the same amount of wires or a different amount of wires for each.

Regarding claims 26 and 29, the wavelength of emission of the laser diode is not disclosed. However, 980 nm lasers are well known in the art, and it would have been obvious to one skilled in the art to use this specific type of laser diode as a matter of obvious engineering design choice depending on the intended application for the use of the laser.

Claims 6-9 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Kuribayashi or Peterson, in view of Kato et al. (US 6,349,104). Kuribayashi and Peterson disclose the limitations of the claims shown above, but do not disclose that the laser diode contains a ridge as claimed. Kato teaches in Fig. 2 a laser diode having a ridge, where the ridge is between bonding pads 12 at the top of the laser diode, and at least one of bonding members 12a, 12b does not pass over the ridge, depending on the placement of the laser diode and the portion it is bonded to. It would have been obvious to one skilled in the art to replace the laser diode of Kuribayashi or Peterson with the laser diode of Kato because this laser diode has improved high power lasing characteristics, as taught by Kato.

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Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367.

The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
January 29, 2003


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